

Claims

- [c1] A multi-chip circuit component comprising:
- a first substrate member formed of an electrically-nonconductive material, the first substrate member having oppositely-disposed first and second surfaces, an outer layer of thermally-conductive material on the first surface, and electrically-conductive areas on the second surface, at least two of the electrically-conductive areas being electrically separated from each other;
 - a second substrate member formed of an electrically-nonconductive material, the second substrate member having oppositely-disposed first and second surfaces, an outer layer of thermally-conductive material on the first surface of the second substrate member, and at least two electrically-conductive areas on the second surface of the second substrate member;
 - at least two circuit devices between the first and second substrate members, each of the circuit devices having a first surface electrically contacting at least one of the electrically-conductive areas of the first substrate member, each of the circuit devices having a second surface electrically contacting a corresponding one of the electrically-conductive areas of the second substrate mem-

ber;

first lead members electrically coupled to the electrically-conductive areas of the first substrate member;

and

second lead members electrically coupled to the electrically-conductive areas of the second substrate member.

- [c2] The multi-chip circuit component according to claim 1, wherein the first and second substrate members are formed of a ceramic material.
- [c3] The multi-chip circuit component according to claim 1, wherein the outer layers of the first and second substrate members have a solderable surface.
- [c4] The multi-chip circuit component according to claim 1, wherein the at least two circuit devices comprise a transistor and diode or a pair of transistors.
- [c5] The multi-chip circuit component according to claim 4, wherein the at least two circuit devices comprise a pair of insulated gate bipolar transistors.
- [c6] The multi-chip circuit component according to claim 4, wherein the at least two circuit devices comprise a pair of field effect transistors.
- [c7] The multi-chip circuit component according to claim 1,

wherein a first of the at least two circuit devices is a transistor and a second of the at least two circuit devices is a diode, the first surface of the transistor comprising gate and second electrodes electrically contacting two of the electrically-conductive areas of the first substrate member, the second surface of the transistor comprising a third electrode electrically contacting one of the electrically-conductive areas of the second substrate member, the first surface of the diode comprising an electrode electrically contacting one of the electrically-conductive areas of the first substrate member, the second surface of the diode comprising an electrode electrically contacting one of the electrically-conductive areas of the second substrate member.

[c8] The multi-chip circuit component according to claim 7, wherein the first lead members comprise at least one finger electrically coupled to the gate electrode of the transistor and at least one finger electrically coupled to the second electrode of the transistor and to the electrode on the first surface of the diode.

[c9] The multi-chip circuit component according to claim 7, wherein the second lead members comprise at least one finger electrically coupled to the third electrode of the transistor and electrically coupled to the electrode on the second surface of the diode.

- [c10] The multi-chip circuit component according to claim 7, wherein the transistor is an insulated gate bipolar transistor.
- [c11] The multi-chip circuit component according to claim 1, wherein the multi-chip circuit component is one of a plurality of substantially identical multi-chip circuit components mounted to a substrate and connected in parallel to define at least one switch.
- [c12] The multi-chip circuit component according to claim 1, further comprising thermally-conductive members contacting the outer layers of the first and second substrate members for conducting heat from the multi-chip circuit component in opposite directions through the first surfaces of the first and second substrate members.
- [c13] A multi-chip circuit component comprising:
a first substrate member formed of an electrically-nonconductive material, the first substrate member having oppositely-disposed first and second surfaces, an outer layer of thermally-conductive material on the first surface, and electrically-conductive areas on the second surface, at least two of the electrically-conductive areas being separated from each other;
a second substrate member formed of an electrically-

nonconductive material, the second substrate member having oppositely-disposed first and second surfaces, an outer layer of thermally-conductive material on the first surface of the second substrate member, and at least two electrically-conductive areas on the second surface of the second substrate member;

a first chip between the first and second substrate members, the first chip carrying a transistor having a gate electrode and a second electrode on a first surface thereof and a third electrode on an oppositely-disposed second surface thereof, the second electrode electrically contacting a first of the electrically-conductive areas of the first substrate member, the gate electrode electrically contacting a second of the electrically-conductive areas of the first substrate member, the third electrode electrically contacting a first of the electrically-conductive areas of the second substrate member;

a second chip between the first and second substrate members, the second chip carrying a diode having a first electrode on a first surface thereof and a second electrode on an oppositely-disposed second surface thereof, the first electrode electrically contacting one of the electrically-conductive areas of the first substrate member, the second electrode electrically contacting a second of the electrically-conductive areas of the second substrate member;

at least one lead electrically coupled to the first of the electrically-conductive areas of the first substrate member;

at least one lead electrically coupled to the second of the electrically-conductive areas of the first substrate member; and

at least one lead electrically coupled to the electrically-conductive areas of the second substrate member.

[c14] The multi-chip circuit component according to claim 11, wherein the first and second substrate members are formed of a ceramic material.

[c15] The multi-chip circuit component according to claim 14, wherein the ceramic material is selected from the group consisting of alumina, aluminum nitride, silicon nitride, beryllium oxide, and insulated metal substrate materials.

[c16] The multi-chip circuit component according to claim 13, wherein the outer layers of the first and second substrate members have a solderable surface.

[c17] The multi-chip circuit component according to claim 13, wherein the transistor is an insulated gate bipolar transistor.

[c18] The multi-chip circuit component according to claim 13, wherein the transistor is a field effect transistor.

- [c19] The multi-chip circuit component according to claim 13, wherein the multi-chip circuit component is one of a plurality of substantially identical multi-chip circuit components mounted to a substrate and connected in parallel to define at least one switch.
- [c20] The multi-chip circuit component according to claim 13, further comprising thermally-conductive members contacting the outer layers of the first and second substrate members for conducting heat from the multi-chip circuit component in opposite directions through the first surfaces of the first and second substrate members.